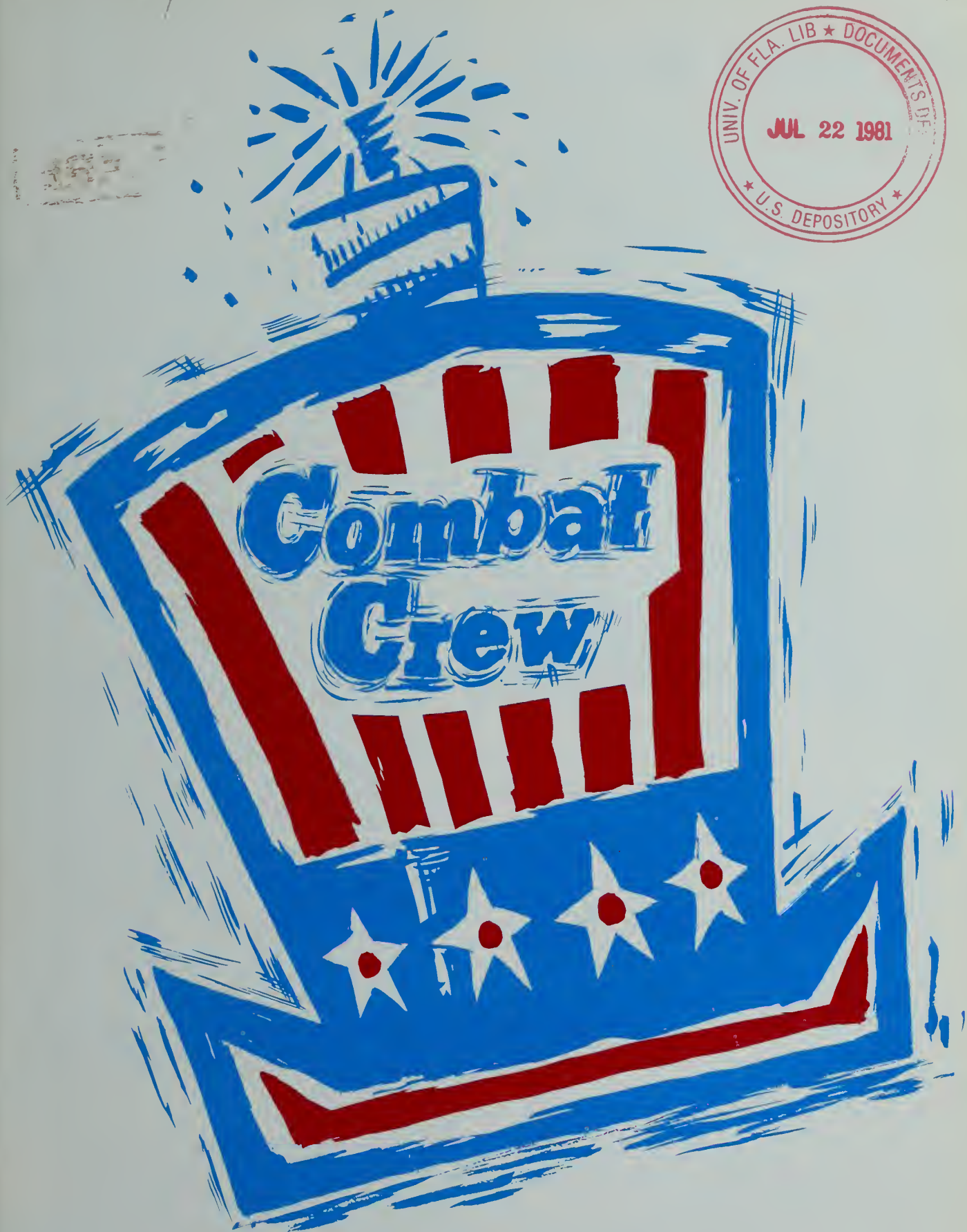


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strategic air command
JULY 1981 ★★★★★

Combat Crew

Magazine of the Strategic Air Command - 31st Year of Publication

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**Enjoy the Fourth
of July – Drive Safely!**

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FROM THE CINC . . .

The past four years have been challenging ones for SAC and its people. During this period, we began to feel the full impact of the force modernization program delays, stretch-outs and cancellations that took place during the 1970s . . . we saw three paycaps, two pay raise reallocations and continued high inflation contribute to a decline in the retention of the top quality men and women — particularly in the supervisory grades — needed to accomplish the Command's mission . . . we witnessed the Soviets modernize their entire strategic arsenal and increase their deployed nuclear warheads from 3,500 to over 7,000, all of which culminated in an adverse strategic imbalance between the U.S. and the U.S.S.R.

Despite these and other "handicaps," there was never a time during those four years when it was not possible for me to stand before any Congressional committee and state, without hesitation: "The men and women of SAC are ready." Like everyone else, we had our equipment problems, our personnel shortages and our funding shortfalls — but, at every step along the way, SAC remained ready. While others were still debating the organizational structure for a deployment force, the SAC Strategic Projection Force was flying simulated combat missions on the Red Flag range in Nevada. While our statesmen talked across the arms negotiations table with the Soviets, SAC alert forces stood as a constant reminder that this nation was prepared to back talk with action. SAC was ready . . . and the enemy knew it.

Such a level of readiness can be sustained only through discipline: a disciplined supply system; a disciplined organization; and a disciplined cadre of dedicated, expertly trained and properly supervised

people. Not everyone is capable of measuring up to the demands of this Command . . . to the high standards, strict operating procedures and unbending personal disciplines that have become the hallmark of SAC and its people. This is what distinguishes the professional SAC crew member, maintenance technician and support specialist from all the rest.

These same personal disciplines will serve you well in the tough years ahead as our nation begins to rebuild its strategic force structure. But, all is not bad news. Although we do face a period of some risk during the next decade, the future has never looked more promising than it does right now . . . provided current and proposed modernization programs are followed through to completion.

The Command stands on the threshold of an era of modernization unparalleled in the past two decades. The need for an advanced manned penetrating bomber has been recognized as critical to America's TRIAD of deterrent forces and work should soon begin on a follow-on to the B-52. For our ICBM force, the MX is in full scale engineering development and studies are now underway at the national level to confirm the basing mode. Other major improvement programs — such as reengining the KC-135 fleet, enhancing the E-4 advanced airborne command post aircraft program and improving our command control and communications capability — are being actively pursued and should come to fruition during this decade.

And, this represents just the beginning. In the past, missile and aircraft operations often were regarded as separate entities, but that idea was forever changed this past April when the Space Shuttle Columbia lifted off from the Kennedy Space Center. At that moment, nearly eight decades of aviation technology coalesced as the concept of airpower truly became aerospace power.

Future shuttle operations as well as other space



related activities represent the start of an important new chapter in SAC's evolving strategic mission. Each of you will be a part of this new frontier and if you have prepared properly and know your job, there is nothing you cannot, and will not, accomplish.

A tremendous adventure awaits you in the years ahead and I only wish I could see over the horizon and share those exciting moments with the most professional men and women I have ever had the pleasure to command. You have not only made me extremely proud to be your commander, but also brought great honor and respect to yourself, your command and your nation. I wish you continued success in the future and ask that you remain personally dedicated to preserving the strength, spirit and reputation of the finest command in military history.★★★★

R. H. Ellis
General, USAF
Commander in Chief



REFUELING BEHIND THE KC-10

**Capt Robert P. Ullman and
Capt Myhre E. Paulson, Jr.
320th BMW**

You're scheduled for a refueling on a normal training sortie. No problem right? Then you notice something odd in the remarks column of the schedule: it says KC-10!

What's it going to be like refueling a B-52 behind the KC-10? To find out we went out in a B-52G with three pilots from the Flight Test Center at Edwards. We spent six and one-half hours behind the KC-10 testing the boom and refueling system compatibility with the B-52. During the first several hours, the Edwards test pilots checked the boom separation

characteristics in all portions of the boom envelope. With the help of the boom operator they got precision disconnects at all positions from the center of the envelope out to the extreme limits. All of this was photographed by cameras on a specially modified KC-135 chase plane. After this we got a chance to try our hands behind the KC-10 while completing the tests on transfer rate.

During the transfer tests, we tested the ability of the B-52 to accept fuel from the KC-10. Operational KC-10's will be equipped with six fuel transfer pumps. The test KC-10 had four pumps and we

checked the transfer rates with one, two and four pumps working and with four to eight tanks accepting fuel in the B-52. During the tests, it took five minutes to get all four pumps up to speed and allow the test equipment to accurately measure the transfer rate. When the transfer rate tests were complete we also did tests of reverse refueling and pressure refueling. During the reverse refueling we passed about 30,000 pounds of fuel using a number of different combinations of tanks feeding from the B-52.

We are able to get transfer rates of 1000-1500 pounds per minute and had no problems at all. We also did about 10 minutes of pressure refueling — that is, holding the boom in place using telescoping pressure on the boom and not using the refueling toggles on the B-52 to hold the boom in place. This procedure went very smoothly — the only change from any other refueling was an increase in power to counteract the pressure from the boom.

The first thing we noticed was that the KC-10 appeared to be no larger than the KC-135, probably because the fuselage is so clean and the two underwing engines are close to the fuselage. It certainly didn't look as big as we had anticipated. Next, we noticed that it took 4000 to 5000 pounds higher fuel flow to maintain pre-contact or contact position.

The downwash behind the KC-10 is substantially higher than behind the KC-135. Although we were concerned that the exhaust from the KC-10 engines might make control difficult, we noticed no problems with control caused by jetwash. The exhaust from the tail-mounted engines does not affect the B-52 vertical stabilizer. The power changes required for moving from precontact to contact or correct position once you're hooked up are still small — 1500 pounds per hour is enough. The KC-10 autopilot does have an autothrottle system which can be used to control airspeed during refueling. We found that refueling with the autothrottle engaged was more difficult than without. The autothrottles are the equivalent to a KC-135 pilot making constant power changes to hold constant airspeed. So much for power.

There's good news about maintaining azimuth and elevation — it's easier than with the KC-135. The director light system gets partial credit. It's a big improvement over the KC-135 system. As we've known all along, the KC-135 system leaves something to be desired — for one thing, you can't even see the lights during bright daylight. Well, the KC-10 lights are a big improvement. The lights are very visible, even in the midday sun. Another improvement is that the "in the green" light is really green. When you move out of the green, you'll notice that not only do the lights change but the letters (F, D, U or A) that tell you which way to move also light up. This helps draw your attention to the needed correction. There's another change

too. If you're moving pretty quickly in any direction the lights will begin forecasting your movement instead of telling you where you are now. This feature will help get the big deviations under control and avoid some inadvertent disconnects. We found some good references for precontact and contact. The patch of daylight you see behind the wing of the KC-135 when in contact is also there with the KC-10. There are also good azimuth references on the forward part of the KC-10 fuselage. We feel that there are enough good visual references to make refueling easy and we will undoubtedly establish a number of others.

There are a number of other differences between the KC-10 and the KC-135. The major differences are in the boom, the boom operators station and controls, and the fuel transfer rate. The boom itself is about two feet longer in the telescoping section and has azimuth travel of about 15° either side of center. This gives us a slightly larger envelope to live in. When moving in azimuth, the boom rolls to the side as well as pivots, unlike the 135 boom, which only pivots. The boom is controlled by a rudder and elevator system unlike the system on the 135 ruddervator. The boom operator sits up in a compartment that looks a lot like a rearfacing cockpit. He "flies" the boom using a control stick. Unlike the 135, the boomer flies the boom by "wire," that is, the control stick is actually hooked to a computer and the computer directs the boom movement. This has two advantages:

First, it reduces the physical workload on the boom operator.

Second, the computer can be programmed for optimum boom operation with each different type of receiver aircraft. There's another significant difference in the boom system. With the KC-135 the limits are always the same. In the KC-10, besides being able to program the computer for each receiver, the boom also has a slew rate feature. What this means is, the faster you are moving toward a limit, the sooner you'll get punched off the boom. For example, let's say you're moving toward the aft limit (21 ft) at one foot per second (not very fast). In this situation, the computer won't punch you off until you actually reach 21 feet. However, let's say you're zipping toward the limit at three feet per second (very uncomfortable). Well that computer isn't going to put up with that and will punch you off at say 18 feet. In other words, the slew rate system will keep you from exceeding the boom limits. This is good news and bad news. The good news is that this system will help eliminate boom damage due to disconnects at extreme limits. The bad news is that all those saves you've been making on checkrides will probably end up being disconnects. The new boom and refueling system can offload over 8000 pounds per minute with a total offload of 300,000 pounds possible.

920 AREFS Wins . . .



...The Albert L. Evans Memorial Trophy

The third annual, AF wide, boom operators air refueling conference was recently conducted at Offutt AFB, NE. Culminating the conference, was the presentation ceremonies awarding the Albert L. Evans Memorial Trophy to the 920AREFS, 379BMW, Wurtsmith AFB, MI. The award presentation was conducted by B/Gen Autery, Assistant Deputy Chief of Staff Operations, HQ SAC. Representing the 379BMW were: Colonel Barr, Director of Operations; Lt Col Allen, 920AREFS commander and SMSgt Mowl, 920AREFS Inflight Refueling Program Manager. SAC Staff attending were: Colonel Moffett, Director of Tanker Operations, HQ SAC (sponsor of the event); Colonel Bonderer, Assistant Director for Contingency and Logistics, HQ SAC; Colonel Strain, Director of Operations, HQ 8AF; and CMSgt Reynolds, SAC/CMSgt. Special guests attending the ceremonies were: CMSgt McCoy, Air Force CMSgt; CMSgt Lord, Enlisted Aircrew Representative at the Pentagon; and CMSgt Sanders, Boom Operator Functional Manager at HQ/AFMPC.

The trophy was established in memory of SMSgt Albert L. Evans, a pioneer in the history of SAC's air refueling operations who was fatally injured in a KC-135 mishap at Castle AFB, CA in September 1979. The purpose of the trophy is to annually recognize, on a rotational basis, the outstanding boom operator section within the command, based on the collective accomplishments and professional qualities of the assigned boom operators.

The idea for a trophy that would recognize the outstanding achievements of boom operators in individual tactical units was conceived by TSgt Richard R. Johnson, an instructor boom operator assigned to the 4017th Combat Crew Training Squadron, Castle AFB, CA. Sgt Johnson noted, virtually all other crew specialties have one or more types of awards for achievements. Sgt Johnson also noted, in a number of instances, individual boom sections performed in an outstanding manner and it

was possible, in these instances, the boom operators may not receive the recognition they truly deserve. With this in mind, Sgt Johnson began thinking about a trophy that would recognize boom operators for outstanding and sustained performance. After many months and numerous drawings a design for the trophy was established. The trophy would consist of two KC-135s flying in formation, mounted on a mahogany base with a number of name plates and the Strategic Air Command Crest set in the middle. The inscription on the trophy reflects the intent of the designers — "Dedicated to All Boom Operators". The funding for this trophy came entirely from the boom operators of the 4017CCTS. The design of the trophy and the manufactured product was the handiwork of Mr. R. V. Southwick of Fresno, California. Mr. Southwick has been building models for the movie industry for years. He is also credited with building models for major aircraft corporations and NASA. The subsequent formal presentation of the trophy to the Strategic Air Command was accomplished at the second annual boom operators conference in May 1980. It is the desire and intent that this trophy stimulate a sense of pride, achievement, and esprit de corps in all boom operators.

Nominations for this prestigious award must be substantiated by citing evidence of sustained excellence, accomplishments, contributions, improvements, professional qualities, air refueling safety record, and problems overcome throughout the rating period of 1 January through 31 December each year. As the initial recipient of this award, the 920AREFS can be extremely proud of this honor and they indeed have set the standard for all air refueling squadron boom operator sections vying for this prestigious award in future annual competitions. Congratulations to the 920AREFS and especially all the boom operators throughout the command who provide the vital link in the Air Force wide commitment of inflight air refueling.

Mishap Prediction and Avoidance: Simply Complex

Maj Richard Szafranski
Hq. SAC, Offutt AFB

When I was stationed in the north country four years ago, there was a newly arrived joke (meaning it was probably already two years old) making the rounds that went something like this:

The commander of a detachment of carrier-based *kamikaze* pilots called a meeting on the carrier flight deck. The pilots assembled haphazardly.

"Our mission today is to take off, fly 200 miles until we find the American naval task force. Boats like this with different flags. Identify the carrier in the center of the group and then, for the Emperor, dive your planes into the carrier and sink it!" He paused. "Any questions?"

Out of the gaggle of pilots only one lieutenant raised his hand. The commander pointed to him, "You, lieutenant, what is your question?"

The lieutenant stepped forward. "My question is: Is the Emperor out of his flipping mind?"

The joke draws laughs among aviators because the lieutenant, even though supposedly a Divine Wind suicide pilot, questions the sanity of a one-way mission. None of us have so little regard for our lives that we would intentionally take off on a mission from which there was no return. Yet the inescapable fact is, that among all the aviators of the world, nearly every day an airplane takes off on a flight that ends in catastrophe. Some are lost to hostile action, some are lost to weather, to poor maintenance, to catastrophic systems failures, or when the student or mission-ready pilot just can't hack it. Our intention may always be to return but, sadly, some of us don't.

Mishaps don't just happen, they are caused. When a mishap occurs, irreplaceable equipment and invaluable lives can be lost. So if mishaps are to be avoided, how do we avoid them?

You can't avoid them unless you understand something about the dynamics of causality; the way in which seemingly innocuous things can combine and become "hypergolic," to borrow a meaningful word from the missileer's lexicon. But that understanding alone is not enough. *Each and every one of us* have to *act* on our knowledge and inter-

vene to disrupt the causal chain building toward calamity. Let me explain what I mean.

The cause of a mishap, in my view, is never a single thing because flying and missile-ing are not simple "single thing" activities. Our operations are rather complex and involve at least four interactive elements: operators, maintainers, supervisors and equipment. The first three elements are categories of human beings and the last element, including all those inanimate objects we manipulate, are operated and maintained by human beings. So all the activities supporting our operations are dependent on people. Are mishaps, then, always caused by people?

Ultimately, since human beings make, maintain, inspect and operate aerospace machines, they are necessarily responsible for mishaps. But that cosmic answer is of little help in preventing mishaps. A better answer would be: *certain attitudes and types of performance are more likely to increase the probability of a mishap than others*. For example, Pilot A knows the tech order inside and out, thoroughly understands the procedures to be used for each task, has flown several thousand hours in the same type aircraft and has a perfectly integrated brain-eye-hand linkage. Pilot B, on the other hand, can and does follow the tech order but, because of inexperience, does not always understand the sequencing or rationale behind some tasks. Pilot B has a few hours more than a thousand and only 300 in the aircraft to which currently assigned. Additionally, Pilot B is not the best stick in the world and flies somewhat mechanically.

Which pilot is more likely to be involved in a mishap? Although we all want to nail Pilot B as having higher mishap potential, the correct answer is much more complicated than that. Because when Pilot A and Pilot B strap themselves to their separate airplanes, the first few links of the causal chain leading to a mishap may have already been forged. Before each of those pilots start their preflight, hundreds of maintainers superintended by dozens of supervisors have already manipulated the thousands of pieces of equipment which constitute an aerospace machine. Pilot preflights and pre-takeoff checks provide only a rough and in-

TABLE ONE

OPERATORS	SUPERVISORS	EQUIPMENT	MAINTAINERS
Poor knowledge of systems: electrical, fuel or hydraulic	Defensive of unsatisfactory performance in subordinates	Old equipment	Lost tools
Inability to distinguish between "go" and "no-go" items	Desk-bound	Unusually high or low cost per flying hour	Unsatisfactory QC checks
Poor tech order maintenance	Tolerant of quibbling	Above average mean time between failures	Failure to document actions performed
Inability to dead reckon with minimum aids	Inexperienced or naive	Held together by locally devised "work-arounds"	Chronic inability to duplicate reported discrepancies
Checklist or flight deviations under stress	A careerist who is just passing through	Poor performance on money missions	Widespread substance abuse or disciplinary problems
Poor health discipline, eating or sleeping habits	Chronic failure to follow up	Exposed to extreme weather	Failure to rigorously follow the tech order
Acceptance of low standards or dual standards	Inability to prioritize	Maintained by inexperienced hands	Preflight discrepancies not detected
Tendency to pencil-whip, square-fill or shortcut	Dishonest or tolerant of dual standards	Operated by inexperienced operators	Adversary relationship with operators or supervisors
Lack of confidence; unexplainable caution	Evasive when questioned directly	Fleetwide shortage of spares	Poor performance on money missions
Over-confidence; careless or ignorant	Poor performance on money missions	Due for major mod or recently returned from mod	Lack of cooperation or responsiveness when interface is necessary
Poor performance on money missions	Manifests obvious stress behaviors	In-commission despite legendary gremlins	Tendency to pencil-whip, square-fill or shortcut
Very low time or very high time	Attributes most problems to shortages in people or skills	Not fully inspected after repair or replacement	Acceptance of low standards or dual standards
Sloppy flight procedures; no "air presence"	Organization has discipline, substance abuse or retention problems	History of intermittent operation	Willingness to defer discrepancies

complete approximation of how all those mission-supporting, life-sustaining and gravity-defeating systems will perform during the flight phase. Thus, Pilot A may be just as likely to be involved in a mishap as Pilot B. Pilot behavior inflight, as important as it is, may be the last link in a causal chain affected by the prior actions of hundreds of people.

To disrupt the chain of events leading to a calamity requires more than the attention of pilots. It requires the attention of non-pilot crewmembers whose duties have direct mission impact, of maintainers who daily prepare the aircraft for flight, and of supervisors responsible for developing, integrating and monitoring the actions taken by the entire aerospace team to fulfill the mission. The combined behavior of all those people is important because: *Mishaps can occur when the bad attitudes of separate team members are allowed to combine or when good attitudes become inappropriate for the*

situation.

We would all probably agree that the following are "good" attributes: enthusiasm; desire to complete the mission in spite of obstacles; the quick response to emergencies; the studious application of the checklist; and, a solid understanding of tech data. Similarly, we might all agree that the opposite of these are "bad" attributes: indifference; an unwillingness to complete the mission if even the smallest obstacle exists; the inability to act decisively in an emergency; partial or haphazard application of the checklist; and, ignorance of tech data. However, even agreed-upon good attributes can, if misdirected, become dangerous liabilities: enthusiasm can become target fixation; intense desire can become "get-home-itis" or some other brand of recklessness; decisiveness can become haste; and knowledge can lead to inventing shortcuts.

Since hundreds of humans have direct impact on

our operations, mishap prevention is an exceedingly complex matter. But, if you're worth your salt, you will not be put off by that complexity. "It is possible for one person to eat an elephant," says the Hindu sage, "if the elephant is eaten one bite at a time."

You must take the first bite. Understand all the factors which influence your behavior and work to develop the attitudes and level of performance necessary for safe operations. The second bite is a little bigger, because it requires you accept we're all in this together and we are all obligated to examine, assess and improve the performance of each other. That requires you demonstrate "leadership." By leadership here I mean *influencing others* to perform safely, and that's the last bite. Unfortunately, this is the bite which most people choke on. Some people don't understand how a navigator can lead a pilot, or a pilot can lead a crew chief, or a crew chief can lead a squadron supervisor.

If you could combine leadership with a perfect understanding and command of the factors which cause people to act the way they do, you could (theoretically, at least) put an end to most mishaps. However, no human being can do that. What you can do, though, is to be constantly alert for the attitudes and characteristics symptomatic of those deeper problems which are always present right before a mishap occurs. Once you see the evidence of those symptoms in your organization, you know to act. If you don't act, a mishap may occur. What attitudes and characteristics am I talking about?

The table below portrays attitudes and characteristics in people and things which have caused mishaps in the past and can, if uncorrected, cause them in the future. The value of such a table is not in its ability to predict mishaps, but in its ability to help you deny the predilection from coming to fruition. Across the top of the table are the four principal elements which interact to perform the mission. Under each element are "bad things" to look for. Those "good-things-turned-inappropriate" are not included in the table because they are too numerous to list. Now rate your organization by circling those undesirable characteristics you know are present. The presence of a single circle, given the right circumstances, could mean trouble. The presence of a group of circles most certainly will increase your chances for mishap occurrence.

There are, of course, other indicators. A friend of mine is assigned to a wing which just experienced a Class A mishap with no fatalities. The accident, my friend asserts, must have been caused by long hair, because the day after the mishap the wing commander came down hard on haircuts. Long hair isn't necessarily a useful indicator of impending disaster. Whatever predictive power the combined hair length of a unit has, and it does have a little, it has no value if everyone gets a haircut *after* a mishap occurs.

We've intuitively known for years that there are indicators which foreshadow a mishap, and our responses have generally been, on the one hand, to work to eliminate them and, on the other, to stop them from combining. Look at your own organization: Is not the best co-pilot always crewed with the worst or most inexperienced pilot? Isn't the radar navigator with the most problems always on the same team as the best navigator? Don't we always give the sorriest airplane to the best crew? Isn't the best supervisor always given control of the least proficient subordinates? Each of the three categories of people — operators, maintainers and supervisors — have evolved ways to *internally* correct individual deficiencies and weaknesses and *internally* stop these from combining. And, at every supervisory level in the wing, the wing's senior leaders work both the deficiency behavior and the combination problem hard. Yet, we still have mishaps.

We have them, I think, not because our senior leaders aren't working the problem hard enough (although one must admit this may be a possibility in certain outfits), but because they're not getting all the help they could. We, you and I, may not be doing all we can. Perhaps we really don't care as much as we should about the attitudes and performance of others. We don't have enough leaders, I submit, at the lower levels of the organization; people who care enough about the wing to work to reduce its collective mishap potential.

One way to solve the problem or begin solving it, would be to familiarize yourself with the elements in the table. Let those items complement your intuition. When you see something you suspect is amiss or know is wrong, ask "*Why?*" *Why*, nav, can't you dead reckon? Pilot *why* don't you get some sleep before you fly? *Why* don't you fly with us, boss? *Why* don't you use that big black binder when you come to fix my airplane, chief? *Why* are the brakes always so hot after you land? *Why* isn't this written up?

That "why" is what I call leadership. The more you ask "why," the more you focus attention on a suspicious area. If the answer to your question is not satisfactory, the question stands as a challenge. If the answer is satisfactory, you have a standard by which you can evaluate the response the next time you ask "why?" If you're unwilling or afraid to influence others, you're not a leader and you're in the wrong profession. Leadership forces you into the causal chain leading to mishaps. If *you* don't disrupt it, who will? Without *your* help, mishaps — predictably — will continue to occur. If you refuse, for whatever reason, to involve yourself in all the elements which interact to get you safely airborne and back again, then someday things could combine to get you. Don't contribute to mishaps by failing to contribute the leadership that can prevent them.

CFIC CORNER

From time to time, crews throughout the command experience multiple emergencies or situations that require superior airmanship, and handle them well. Our policy at CFIC has always been to provide the widest possible dissemination of these occurrences. If one of these "flights with hair on it" happens to you, give us a call or write it up and we'll try to get it published. This month's CFIC Corner is just such a story told by Capt Lou Buckner, an IP from Barksdale. In it he says his crew was lucky. Yes, they certainly were. But as in many potentially catastrophic situations, the actions taken by this crew insured that a good war story rather than a large smoking hole in the ground was the final result. I'm sure we can all learn something from Lou's story. Fly the Aircraft.

**Harry C. Hamby, Lt Colonel, USAF
Chief, SAC CFIC Division
Castle AFB**

“THIS ONE HAD HAIR ON IT”

Capt Lou Buckner

Everyone's had a catastrophic sim. It's the one where the situation gets progressively worse, until you're confronted with a many engine out approach with the flaps up. During this mission, the instructor will flame out engines, fail electrics, and show you emergencies you never dreamed existed. He may put the simulator on freeze many times so the pilots can find solutions in the dash one. Once the emergencies are solved and the landing data is computed, you continue on to a full stop landing. "Normal, normal", you say. Well, my crew and I had the same type of emergency the other day, but it wasn't in the simulator. There was no instructor to put the aircraft on freeze, and the solution was not easy to find in section three.

By describing the events leading to the heaviest no flap, two engine out landing ever made in a B-52, I want to tell you how airmanship and crew coordination saved us from imminent disaster. By airmanship, I mean the ability to think and fly under the worst conditions. It's what CFIC means when they say, "FLY THE AIRCRAFT". By crew coordination, I mean knowing your EW and Nav will think as you do when the chips are down. Both airmanship and crew coordination, when put together, form a professionalism that shows when

it's as bad as it's ever been and getting worse. They are what the best crews are made of.

For this situation, I'll describe what happened from the cockpit point of view. I won't discuss any systems malfunctions or any effects that emergency procedures had on them. I'll eliminate all descriptions of sweaty palms, shaking knees, and dry mouths. This is done to clarify the facts and let you see what I saw sitting in the pilot's seat. The description will be chronological.

My crew was scheduled for an early morning, (very early), takeoff on a mission in support of Global Shield 81. The planned events for this mission included a heavy weight takeoff, cell departure with Piano 01, air refueling, and low level bombing. Our cell leader that night took off thirty minutes before us. We were delayed for maintenance on the ground.

When we did make our takeoff, our problems started right after gear retraction. First, the number one UHF radio failed. Then, passing 14,000 feet, the aircraft experienced massive failure of forward and aft transformer-rectifiers. The systems we lost are too numerous to list, so it is much easier to tell you what we still had. In the navigator compartment, the C-4 lamps were working. The defense had some

Continued on page 15

The 341st SMW, SAC's first and largest Minuteman wing, and President John F. Kennedy's "ace in the hole" is the only unit with two separate ICBM weapon systems — these are but a few of the characteristics which have distinguished the Malmstrom unit during 20 years of existence. In addition, the 341st is the only unit in SAC to have ever won both the annual missile and the aircraft bomb- and-nav competitions.

Situated in the rolling foothills of the Rocky Mountains, the 341st SMW, based at Malmstrom AFB, Montana, was activated July 15, 1961 as the

the United States and the U.S.S.R. were occurring in an attempt to resolve the conflict. In an effort to bring greater pressure on the Soviets, President Kennedy ordered that Alpha Flight become operational ahead of schedule. This new weaponry, coupled with a naval blockade, obviously contributed to the Soviet decision to withdraw its weapons from Cuba. President Kennedy was grateful and he tabbed the 10th SMS as his "ace in the hole." One year later on July 3, 1963, the entire wing of 150 Minuteman I missiles was declared operational.

MALMSTROM'S TWENTIETH

Capt Byron M. Gold
1Lt John C. Canfield
SSgt. John E. Mason
341st SMW, Malmstrom AFB

first Minuteman ICBM wing. Today, four strategic missile squadrons, each with 50 missiles, together with maintenance, security police and support units, comprise the 341st. These strategic forces are dispersed over 23,000 square miles of land, an area about the size of West Virginia.

The construction of the wing's missile facilities began in the spring of 1961. In 1962 during the Cuban missile crisis, the nation first called upon this new weapon system. During this crisis, Alpha Flight of the 10th SMS was being operationally configured. At the same time, negotiations between

For becoming operational months ahead of schedule and for significantly contributing to the security of the nation during the "Cuban crisis," the 341st SMW was presented the Air Force Outstanding Unit Award for the period, Oct 22, 1962 to Dec 31, 1963. This award was symbolic of the birth of the 341st in August 1942, when the 341st Bombardment Group was organized.

The unit entered combat in early 1943, flying B-25's in Burma. Moving to China in January of 1943, the unit engaged primarily in sea sweeps and attacks against inland shipping. For their per-

formance in French Indo-China and for development of the 'clip' bombing technique by Maj Robert A. Erdin, the 341st Bombardment Group was awarded the Distinguished Unit Citation and three battle streamers from the India, Burma, China Defensive and China Offensive campaigns. The story of the "clip" technique goes like this:

While piloting a B-25 at tree top level in an attack on the Mu River bridge in January of 1944, Maj Erdin suddenly saw a large tree looming ahead of him. He sent his plane upward to avoid hitting the tree and by the time he brought the plane down to its previous attack level, he was directly over the target. Cursing his bad luck and believing the tree had ruined the approach, he ordered the bombs to be dumped. The bombs skipped on the water, exploded and to the amazement of the crew, two spans of the bridge toppled into river. And this method, with refinements later added, became known as the "clip" (glide and skip) bombing tactic.

When the war ended in August 1945, the 341st returned to the United States and on November 2, 1945, it was deactivated at Camp Kilmer, New Jersey. Approximately one year later, it was reactivated at Westover Field, Mass as part of the Air Defense Command. Squadrons assigned to the group included the 10th, 12th, and 490th Bombardment Squadrons. The 491st Bomb Squadron was assigned in May of 1947. The group served as a

reserve unit until it was again deactivated on June 27, 1949.

Six years later, on September 1, 1955, the unit was again activated and reconstituted as a Medium Bombardment Wing at Abilene (now Dyess) AFB, Texas. The wing was assigned to the 15th Air Force of the Strategic Air Command and was composed of Boeing-built B-47 medium "Stratojet" bombers. It was during its tenure at Dyess that the wing won the annual SAC Bomb/Nav competition in 1958.

It was again subsequently deactivated on June 25, 1961 and reconstituted as the nation's first Minuteman ICBM wing. After its reorganization and activation at Malmstrom AFB on July 15, 1961, the 341st continued its record of accomplishment with high alert and sortie effectiveness rates. Then, in August 1964, the modern-day 341st received word from the Air Force that another squadron of 50 missiles would be added to the wing. The 564th SMS, formerly an Atlas ICBM unit and the first ICBM unit in the United States, was ultimately reorganized and assigned to Malmstrom on April 1, 1966, joining the other operational squadrons — the 10th, 12th, and 490th Strategic Missile Squadrons.

This new squadron was equipped with the recently developed Minuteman II missiles and it became fully operational in May 1967. This made



1962 . . . Workers laying cable lines.



The first of 50 launch control centers was emplaced in Montana in 1962. Alpha capsule falls under the 10th SMS, 341st Strategic Missile Wing, Malmstrom AFB.

the 341st the only wing with two separate ICBM weapon systems, which continues to this day.

Shortly after the completion of the 564th complex, the Secretary of Defense announced a force modernization program for all Minuteman I weapon system. The program was developed to update the Minuteman I facilities to house Minuteman II and later, possibly Minuteman III missiles. This modification was completed by May of 1969.

No further remodeling of the wing's weapon systems occurred until 1974. Then it was announced that the 564th's Minuteman II missiles would be exchanged for Minuteman III missiles. The next modification was not to come until three years later. In 1977, an Improved Launch Control System conference was convened at Malmstrom. Out of this conference came a plan to upgrade the 150 wing missile sites assigned to the 10th, 12th and 490th Strategic Missile Squadrons. Known as the ILCSS program, the remodeling enhanced the effectiveness of the Minuteman II missile by updating certain system hardware and software. This program was completed on March 1, 1979. Today the wing's configuration consists of one squadron of Minuteman III's (the 564th) and three squadrons of Minuteman II missiles.

In recent history, the 341st has garnered an impressive array of awards, including several Air

Force Outstanding Unit Awards and many other unit and individual awards and trophies. In 1975 and again in 1976, the wing was selected by HQ SAC as the winner of the Col Lee R. Williams Memorial Trophy, an award made to the best missile wing in SAC each year.

In 1976, the wing also dominated the Olympic Arena missile competition at Vandenberg AFB by winning the Blanchard Trophy, symbolic of the "Best of the Best" within the missile field. It also garnered more individual trophies during the '76 Olympic Arena competition than any other unit has ever won, before or since.

A first for the wing came in 1978 when the 341st Wing Command Post was awarded the Ivan L. Bishop Trophy as the Outstanding Unit Command Post in SAC for the year. No missile wing had ever won the trophy. Finally, the wing recently received the Riverside Trophy for outstanding performance, marking the 341st as the best wing in the 15th Air Force during 1980.

Today, the wing's missile sites stand peacefully among Montana's wheat fields. Their existence is symbolic of the wing's peacetime mission; to maintain a highly reliable force of Minuteman missiles as a deterrent to nuclear attack — a mission the wing has been accomplishing 365 days a year for nearly 20 years, and will continue to do well into the future.

Continued from page 11

lighting and limited fire control capability. Up front, the pilots had emergency lighting, emergency instruments, system fuel quantity indicators, and the HF radio. All other TR powered systems were out.

We decided to continue to climb and press on our flight plan route. After level off, the copilot got into the books trying to find out what happened. We knew we had some type of TR failure, but we were uncertain of exactly what we had. The classic symptoms of forward TR failure were present, but some equipment that should have been working off the aft TR units wasn't. In addition, the battery detect system had failed, not allowing us to see if the battery charging TR units were working.

While we were pulling our hair out over these problems, we were trying to maintain course and plan ahead. We knew without any navigational aids we would need a VFR base for landing, but our home dome and surrounding area was forecast to be IFR all day. By this time, we were dead reckoning toward the Northeast using the mag compass and hacks over large cities, whose lights we could see through the undercast. About the same time, we discovered our savior of the day in the HF radio. It was our one remaining contact with the real world, and it eventually saved us.

We quickly contacted our cell leader on the HF radio and informed him of our problems. Attempting to switch to a discrete frequency, his radio failed, and we then contacted our command post. We requested they find us a VFR landing base ASAP and get radar vectors for the cell leader to rejoin on us.

Waiting on our bomber buddy, we began to experience some of the effects of TR Failure. First, the cabin temperature was rapidly falling to that of the OAT, as the air conditioning controls had failed. The gunner then passed out our cold weather gear. Afterward, he broke open his seat kit and attempted to contact the other bomber on his survival radio without success.

We completed the rejoin and received a vector toward the northwest. By this time, our most critical problem had surfaced. Earlier, we had realized we would have to land when the fuel in the wing tanks emptied, as we had no boost pump control to transfer fuel from our body tanks to the engines. All we had was main tank fuel. But now we realized with 46,000 pounds of fuel stuck in the aft body, that our center of gravity was rapidly moving aft. Using only the fuel from the wing tanks was making this happen faster, and we would soon be out of the center of gravity recommended for flight. We also needed to extend the gear while we had battery power, but doing so could greatly reduce our range and cause the CG to move aft faster. As a result of the CG problem, Boeing advised an immediate landing. Compounding this problem were the icing

conditions at the altitude we were now entering, for there was no anti-ice and the windows were icing over.

The flight was given a vector and descent to our intended landing base, Wright Patterson AFB. After we rolled out from a right turn, a descent was started, and the gear was lowered while we still had battery power. In the descent, the copilot discovered engines one and two had flamed out, and three restart attempts were unsuccessful. We began flying an extended fingertip position on our leader.

Lead turned an extended final and intercepted the ILS offset to one side so that we could line up with the runway. Just as the interphone started to die with the batteries, the copilot computed landing data for a 380,000 pound aircraft. First ground run with drag chute was 10,800 feet, and without drag chute we would end up in the Air Force Museum. Runway length was 12,000 feet. In addition, max brake application speed was 155 KIAS with an approach speed of 193 KIAS, flaps up. The voice on the HF recommended only one approach due to poor go-around capabilities with heavy gross weight, aft c.g., and fuel shift.

Day was slowly breaking, and we picked up the runway at about eight miles, setting up with all we had, a visual glide slope. I aimed the aircraft at the numbers, and as advertised, when entering ground effect, the nose dropped slightly. The resulting pitch change I introduced was enough to cause a flare, and I had to force the aircraft on the runway. We touched about 750 feet down the runway and immediately shut down engines seven and eight and raised the air brakes. This was the most uncomfortable part of the landing, because we had to wait on brake application speed while the runway remaining markers were whizzing by. At the computed speed, we applied brakes, and the left front tire blew. When we reached 135 KIAS, we put the drag chute out, and it worked!

We coasted to a stop 1000 feet from the end of the runway, emergency egressed, and beat feet to the bar, completing a three hour mission. The brakes caught fire about twenty minutes later and burned for a long time.

All is well that ends well. Six crew folks get to walk away from one and have a hell of a bar story to tell. Where does this leave you? Well, sometimes it takes a fiery crash and a few deaths to tell a message, but this time I want it to be the other way around. We were lucky in that we had a super staff advising us and a tremendous wing man leading us. Throw in a little good thinking, experience, plain airmanship, crew coordination, and we survived. Will You? Are you ready for something like this to happen to you and your crew? Will your crew have enough of the "right stuff" when they need it? Believe me, it took all six guys to get this one on the ground. Some said we were lucky. I agree, but I think we made a lot of that luck. Will you?



Good Show

Airman James T. Gardner is a jet engine mechanic assigned to the 305th FMS Propulsion Branch. Airman Gardner and another mechanic were dispatched to troubleshoot a malfunction in the KC-135. They determined the auxiliary power unit (APU) had a low battery and bad igniter plug. After replacing the defective parts an attempt was made to start the APU. As the APU came up to speed, flames burst through the top reaching the ceiling of the aircraft. Airman Gardner instructed his coworker to evacuate the aircraft and notify the fire department while he stayed to fight the fire. He immediately pulled all the APU circuit breakers. Using a fire bottle, he extinguished the blaze and disconnected the battery. By the time the fire department arrived, he had the emergency well in hand. His quick thinking and courage prevented the possible loss of a KC-135 as well as damage to nearby aircraft in the alert area.

PROFESSIONAL PERFORMERS

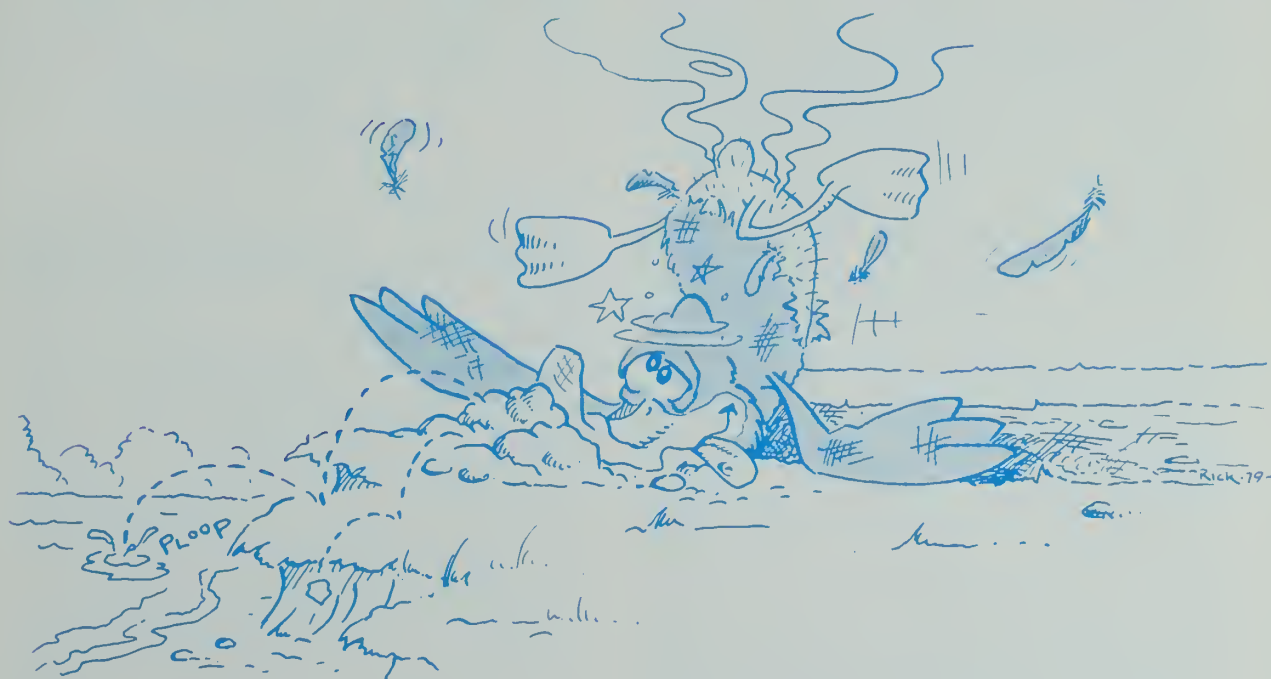
Maintenance Airman

SrA Michael K. Unruh, 9th SRW, Beale AFB, is SAC Maintenance Airman of the Month. Airman Unruh's primary duty is crew chief of a U-2R aircraft. He is a highly qualified responsible technician who is highly motivated. Within three months after arriving at Beale, he won the 9th OMS Outstanding Ground Crew Member award. Seven months later, he was named Airman of the Month for the squadron. Letters of appreciation and recognition have come from the Hq SAC Maintenance Standardization and Evaluation Team, the Director of Aircraft Maintenance at SAC Headquarters, as well as wing, squadron, and detachment commanders. He recently received a personal letter of appreciation from a U-2C accident investigation board president for unselfish efforts toward the investigation process and the recovery of a crashed aircraft. Airman Unruh is a credit to the United States Air Force, the Strategic Air Command, and the 9th SRW.



DUCKING UNDER

Performance and Prevention



Capt Ron Sams 93 ARS, Castle AFB
Reprinted from the May 1979 issue
of *Combat Crew*.

A few years ago, 11 of Boeing's most experienced instructor pilots all crashed in the same day. Though the average flight time logged by these captains was over 10,000 hours, each landed short of the runway. Nobody was hurt, because these crashes took place in the simulator.

Actually, these pilots were part of an experiment that was conducted to determine why four 727's had crashed in rapid succession during landing. A model of a lighted city was constructed which was visible from the simulator windows. Each pilot was instructed to perform a visual approach using all instruments except the altimeter.

In effect, this experiment simulated what happens when the pilot leaves the instruments and goes visual for landing. Eleven of the 12 pilots in the simulator experiment landed short. (One guy made it safely — he was a former Navy carrier pilot.) Each one was somewhat dazzled by his unspectacular performance because this should have been a piece of cake maneuver — but it wasn't.

Why would 11 highly experienced pilots duck

under the proper glide path and land short? The study concluded that perhaps there was more to the duck under problem than simple pilot error. The pilots in the experiment were actually being asked to solve a problem which exceeded normal visual ability.

Given the proper set of circumstances, any pilot will duck under, regardless of experience level or eyesight. As an instructor pilot, I've seen many duck under maneuvers performed, especially at night. Usually the pilot believes that perfect glide path is being maintained and is mildly outraged when I direct a go-around. Why don't pilots recognize a duck under? To find out, let's discuss some visual phenomena which serve to deceive even the most proficient pilot.

Assume we are shooting a 12-mile straight-in approach (Fig. 1). Though line-of-sight (LOS) is a straight line, it's possible for the actual flight path of the aircraft to follow the arc of a circle whose circumference hits the ground short of the airport. As the aircraft arcs below glide path, the pilot shifts his

aim point up in the windshield and maintains LOS with the touchdown target. The pilot assumes that a precise glide path is being flown, yet the aircraft is actually arcing toward a touchdown point short of the runway.

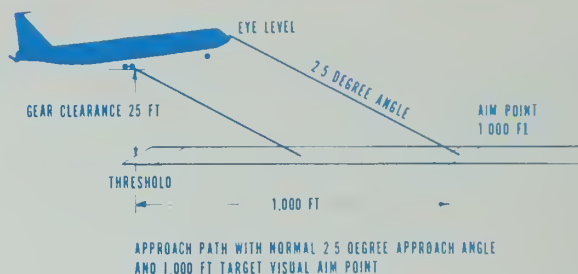
Our eyes are especially deceived at night, and a number of factors can contribute to a duck under. Beware of approaches over dark water or land where there are no lights below or to the side of the aircraft. It is impossible to visually judge your height above the terrain. Sloping or irregular terrain surrounding the airport, or an extremely wide or narrow runway present sensory illusions. Subconsciously, the glide path will be adjusted to reproduce the visual approach picture you're used to seeing (i.e., the home drome syndrome). This may cause you to duck under and land short.

When smoke, fog, haze or other obscuring factors reduce the brightness of the lights below, it creates an illusion that the airplane is too high. This can cause you to prematurely lower the glide path angle or visually change your aim point. There are many other circumstances which can create visual illusions and cause you to duck under, but let's discuss what happens to the airplane when the pilot ducks under.

Consider a KC-135 flying a normal 2.5 degree glide path (Fig. 2). Remember, the main landing gear is about 65 feet behind and 14 feet below the pilot. If the pilot maintains a precise 2.5 degree glide path, the main landing gear will cross the runway threshold at approximately 25 feet above the runway (assuming no landing flare). Using the standard 1000 feet visual aiming point, there is surprisingly little room for error.

Now let's add some visual illusions and consider the possible effects. Suppose the pilot shoots an approach to a runway with a one degree upslope. Believing that the airplane is too high, he ducks under and changes his glide path to a flatter 1.5

FIGURE 2



degrees (Fig. 3). At this shallower, dragged-in approach angle, the landing gear will cross the threshold at approximately three feet above the runway.

Next, let's suppose there is a smoke, dust or fog layer which is lying low across the touchdown zone of the runway. The pilot maintains the 2.5 degree glide path, and decides to change the aim point due to poor visibility and conditions. In doing so the pilot decreases the visual aiming point from 1000 feet to 500 feet (Fig. 4). The result of changing the aim point is that the airplane will touchdown short of the runway.

Finally, let's discuss the most dangerous case. Suppose the pilot is shooting a night precision approach in the rain. Let's assume that he disregards his instruments at minimums and ducks under to get below a ragged ceiling. Let's further assume that he also changes his visual aiming point closer to the end of the runway in a misguided attempt to provide additional stopping distance. The pilot has committed two sins. He has changed his glide path to 1.5 degrees and changed his aim point to 500 feet. In this case, the landing gear will try to touch down 10 feet below runway elevation at the threshold! (Fig. 5).

If you are on course and glide path when you break out at minimums, don't radically change anything. Yanking the power off and diving at the runway in order to establish what you think is a *normal* approach creates a high sink rate close to the ground. This is hazardous to your health. If you level off from a duck under using just the elevator, you will quickly find yourself in a poor thrust/lift relationship.

At approach speeds, a small increase in angle of attack causes a relatively large increase in drag, thus requiring more than normal thrust. If the throttle setting is too low, there may not be enough engine spool up time to stop the sink rate. The flatter the approach angle, the more difficult it is to visually detect any rate of change. Therefore, the pilot flying

FIGURE 1

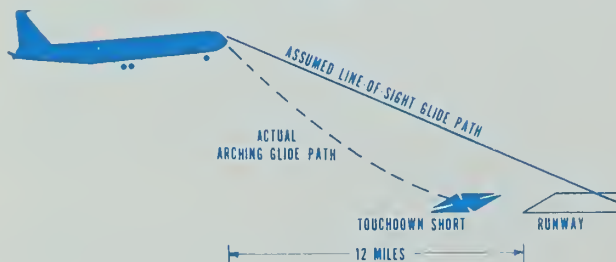
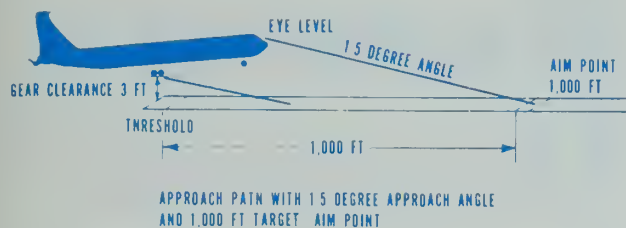


FIGURE 3



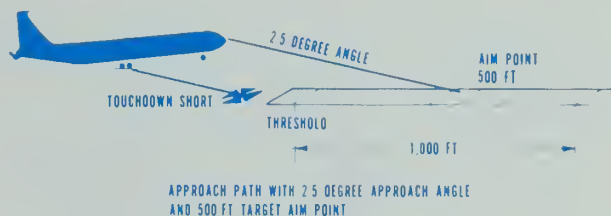
a dragged in approach may not realize his aircraft's sink rate is greater than his means to stop it. If you add a sudden wind shear, the situation quickly becomes hopeless.

How do we prevent duck under maneuvers? First, admit to yourself that your eyes can lie to you, and that your *normal* approach may not be normal at all. There are too many visual illusions to fake out your eyes. Secondly, don't give up vertical guidance, i.e., ILS glide slope, PAR glide path or VASI, after you go visual. Have your copilot crosscheck the glide slope while you are visual. If you go full scale below the glide slope, or red over red on the VASI, it's impossible to tell exactly how far below the proper glide path you really are.

Remember your altimeter. If the approach has published altimeter checkpoints, use them. Monitor your descent rate. For a 2.5 to 3 degree glide path, the rate of descent should be approximately 700 feet per minute. If your VVI is grossly out of that parameter, it should tell you something. You either have a strong headwind/tailwind, or a duck under.

Your radio altimeter can be used to help determine your absolute altitude after you go below the DH/MDA. One technique is to have the pilot not flying the approach call off the radio altimeter readings at 100 feet, 50 feet, and 20 feet. This is not

FIGURE 4



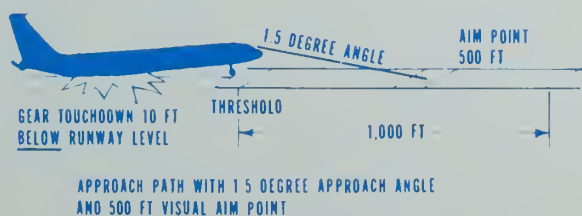
designed as an order to flare for landing, but as an additional crosscheck for height above the runway to aid the pilot's depth perception.

Remember that the performance of your aircraft right now has been determined by what you did a few moments before. If your approach is stable, on glide path and airspeed, and the airplane is properly trimmed, nothing drastic should happen when you look outside at minimums. At some bases, the PAR glide path and the VASI may not agree, so don't let this sucker you into ducking under. If you're fighting to stabilize the approach, take it around and try it again.

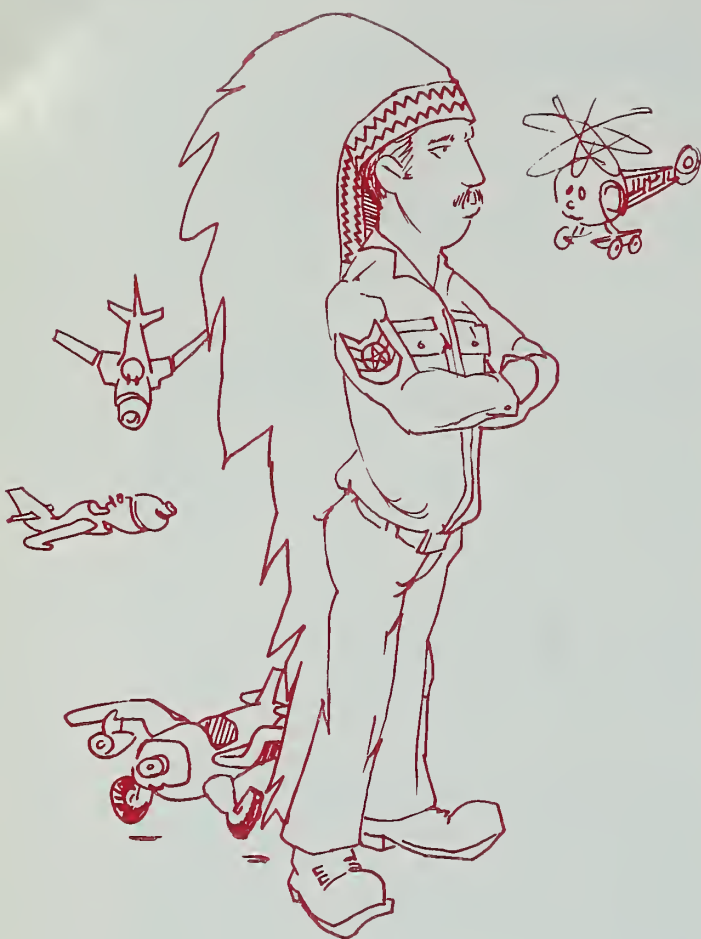
The last 200 to 300 feet of any approach demand the utmost in professional discipline. The safest approach, considering the stopping distances and the landing gear clearance over the threshold, is along a normal 2.5 to 3 degree approach path using a visual touchdown target 1000 feet down the runway. The possible consequences of ducking below those parameters are devastating.

The next time you find yourself well below the glide path, or VASI red over red, remember what happened to a handful of Boeing 737's. They crashed in the simulator. You may not be so lucky!

FIGURE 5



Let's Hear It for the Crew Chief



Capt John C. Witzel
93d AREFS, Castle AFB

Many times in *Combat Crew*, we read stories which truly enhance a crew dog's outlook in the command. There seem to be numerous articles about our brave and quick thinking combat crews who face dangerous situations with professional skill and cunning and come through safely with flying colors.

One person, however, who makes a very large contribution to flying safety — the SAC Line Crew Chief — is often forgotten. The crew chief is the first

person we meet when we arrive at the aircraft, and the last one we see when we depart on the crew bus. These young men and women are responsible for the care of a multimillion dollar airplane and its crew. They live with the airplane like a member of their own family. Why do they do this? What motivates them?

The answer is simple: pride in their aircraft because it is a reflection of themselves; if it is a good airplane, most likely there is a good crew chief in charge of it.

When we first arrive at the aircraft, we naturally expect the chief has everything taken care of from the 781 to the fuel load. All of our expectations didn't just happen like magic — the crew chief was preflighting the aircraft: eight hours, for bombers, and five hours, for tankers, prior to takeoff. The chief is responsible for having the plane ready and safe to fly. Whether it takes five or eight hours, he or she will stay with the airplane until it is ready.

The crew chief will maintain the aircraft within his/her capability, but in addition the chief will direct maintenance effort on the aircraft; identify the need for a specialist to the flight line expediter; monitor the progress of the specialist, and help, if required.

The unsung “muscle” of the crew force . . .

The list of duties goes on and on, as outlined in AFR 66-1, which only mentions the highlights. Let's not forget the many minor duties, such as cleaning up the crew compartment or emptying the “honey-bucket” for the sick passenger. The chief does it because the crew and the airplane are important to him as well as to the nation.

Alert is an essential part of every crew dog's life, and also affects the life of the crew chief, who pays his dues to become a part of the crew force. When an airplane rotates on the alert line, so does the chief and his assistant, on a rotating basis until the airplane is put back on the flight line. Working the airplane will continue on alert, with long preflights every day, and followup maintenance, completed during the alert cycle.

For the winter stricken crew chief, his problems are just beginning. Besides shoveling snow off the aircraft and its parking ramp, the chief must assure all control surfaces are free of ice, sometimes using the “cherry-picker” in sub zero weather. At night, heating water is the order of business to assure ample security in a fast takeoff in an EWO environment. And besides taking care of the airplane, the KC-135 chief will also be required to accompany his/her airplane to war, if launched off alert.

The partnership between the crew chief and the crew force contains many responsibilities — few of which are actually realized by the flyers themselves. We forget about the long hours and day by day endurance of the chiefs to keep us airborne, or ready to launch in an EWO situation. He or she is the backbone of which all flying activity is centered — plus the middleman caught between operations and the maintenance complex. He is the epitome of being “between the rock and the hard place,” but without saying, he always gets the job done.

Where does SAC get these people to endure such a tough lifestyle and love it? It didn't just happen; as a chief is weeded out among many starters and conditions to work his or her way up to crew chief.

Presently, maintenance manpower is running well below set standards, which simply means the crew chief must carry a larger load until relief arrives. Already the chief is working under variable hours, both day and night, with very little time for training and resting. Besides crewing the aircraft, he she must train the assistant and ground crewmembers in their specialty.

What is the reward for working odd hours sometimes seven days a week? Recognition — in being responsible for the best aircraft on the line. But the main pride to the chief comes from the crew who flies the chief's airplane. An excellent way for a crew to support the chief is to write the individual's name and performance in the aircraft commander's report after the flight. Sometimes, we as crewmembers after we have our feet back on the ground, tend to forget about the outstanding preflights given to the airplane before we took off. We should remember the crew chief and do it in writing.

The chief's unselfish attitude toward the Air Force and its way of life is inspirational. In today's world of making each dollar count and resource protection, the crew chief is the best deal SAC has at its service. Besides laboring long hours to make the aircraft operational, he or she must insure the future performance of the aircraft, which in some cases is older than the crew chief himself.

What would be the situation if we asked an Indy 500 race car crew chief to work on a 1961 Indy race car? And if we also asked the race car crew chief to make the older car competitive with the new race car — what would be his reply? Most likely, it would be “Impossible!” SAC crew chiefs may say it is impossible to keep up the airframes, but they get it done.

Our crew chiefs sure don't walk on water, but they do get us across. Let's hear it for the crew chief!

ARE YOU TOO SAFE?

**1Lt Roy L. Gresham
351st SMW, Whiteman AFB**

How safe are you on the job? The answer to this question could be "not nearly safe enough." At a recent missile maintenance evaluation review board, an airman received an unqualified rating for committing an unsafe act during task performance. When asked why, he replied, "I was being too safe and too cautious and I somehow missed a step in the tech order." My point is that you can never be too safe. If that particular airman had been too safe, he never would have omitted that step. If you consider yourself to be too safe, you should ask yourself the following questions:

Do I sometimes get in a hurry and take shortcuts to complete the task faster? This is often the case when your workload has built up or your mind is preoccupied with something that you feel is more important.

Do I use available agencies when I have a problem? That is, do I continue with my task, using guesswork when I encounter an obstacle or a problem? You should terminate your task and call the proper agency, i.e., your supervisor, job control, quality control, or the safety office.

Do I set the proper example for others to follow? Do I comply with all existing safety regulations and technical data? Do I correct subordinates and superiors when I detect an unsafe act? If not, you are probably setting a bad example for someone who may be using you as an example to follow.

Am I current on all safety materials and new trends in safety? Do I read the safety bulletin boards daily and review safety magazines and other safety

materials? If not, you could miss something that may apply directly to you.

Do I act where safety is involved or do I simply give lip service? Do I take the time to report the hazards I discover? Do I promote and sell safety to my fellow workers? Although there are many more questions you can ask yourself, if you answered no to any of the above questions, you are not nearly safe enough.

If all your answers were positive, you have only begun to scratch the surface. Safety should be a vital part of your everyday life both on and off the job. You must be alert for any unsafe condition whatever you are doing. On the job, you should be aware of all parts of your task that require special attention. Preparation before beginning a task is paramount. You should take the time to thoroughly check out your equipment to insure that it is serviceable and safe. Make sure that you understand what your job is and that you are fully trained and qualified prior to attempting to perform a task. Protective equipment can save your life. Be sure that you have the proper protective equipment before beginning a hazardous task. Insure that your equipment is serviceable and that you have been properly trained to wear or operate your protective equipment. Remember, you can never be too safe. Safety should be a part of everything in which you are involved. The question should not be "are you too safe" but rather "are you safe enough?" You should thoroughly and closely evaluate the answer to this question every day.

SAFETY ATTITUDES

1Lt Delbert A. Watkins, Jr.
91SMW/SEM
Minot AFB, ND

How many Quality Control (QC) reports and Safety Inspection reports (SAC Form 581) have you seen with something similar to "supervisory attention is required to . . ." as part of the recommendation? How many times have you seen, heard, or written yourself "lack of supervision" as the cause factor of a discrepancy or even a mishap? Too many times I'm sure.

What I see as an alarming trend in the reports is the lack of supervision by the on-site team chief, the working level supervisor. I know that these people have a very difficult and demanding job. They perform their jobs under some very difficult conditions. The maintenance teams in the missile environment daily face working conditions and long hours that we would not wish on our worst enemy. Even under the restraints of bad weather, old equipment, and low experience levels our people are capable of and generally are, performing their assigned tasks in an excellent manner. Where is our problem coming from? Let's look at some of our discrepancies and see.

I see discrepancies like "SCS key left in D-Box during maintenance," "equipment in vehicles not tied down (or improperly tied down)," "Launch Facility (LF) not properly penetrated IAW tech data," "team accepted damaged, defective, or non-functioning equipment," and "team failed to obtain the proper equipment to complete the assigned task." These discrepancies are disturbing. Why? Because they show a lack of supervisory responsibility by the on-site supervisor, the team chief. The corrective actions supplied by the next higher level of supervision are often just a cover-up "cosmetic" answer and do not attack the real problem. Corrective actions like "equipment secured," equipment turned in for maintenance," and "briefed all personnel" are cosmetic and treat the symptoms and not the disease.

What is the disease? Is it the old "close enough for government work" syndrome? Is it just plain apathy? Or could it be the reflection of the attitudes and actions of us, the mid level and upper level supervisors? Apathy and the "close enough for government work" syndrome are beyond the scope of this article and deserve independent research. However, let's take a look at our own attitudes and actions of our lower supervisors and work force.

What kind of example are we setting for our people? Psychologists have proven that the example set by the leader is the one usually followed by the group. If we are concerned with the "little" things, so will our people be concerned. If we say "So what?" so will our people. If any supervisor in the chain from team chief through the commander drops the ball the whole team pays the price. Let's look at a couple of the more common ways that each of us "drops the ball" in our everyday actions.

We all know that Quality Control (QC) is not 100% perfect. Yet we also know that generally the inspectors are fair, honest, and conscientious. They are also right at least 99.9% of the time. In spite of this, how many times have each of us blamed QC for the discrepancy? Personally, I have blamed QC for my own shortcomings on more than one occasion. I think it is a safe bet to say that we have all been guilty of this at one time. How many times have we also blamed the safety inspector for finding problems in our areas. The QC inspector and the safety inspector are certainly thorough people when performing their jobs, I always thought that they were issued microscopic eyes so that they could catch all of the "little" things that always seemed to be hiding someplace waiting to be found by the "bad guys." Having served in both QC and safety I can assure everyone that that is not the case. You do tend to develop such an eye but that is a story in itself.

What I am getting at is that we each tend to blame others for our own failures at times. The important thing about this is how our subordinates see it.

Generally speaking, if the boss isn't worried, why should I be? If we can foster the blame off onto someone else no one takes the responsibility for the problem. If we see the report discrepancy "equipment not tied down" what do we do about it? Do we say "Darn QC! They're out harassing my people again?" Maybe what we should be saying is more like "Why did this happen? Did I slip up someplace?"

We are not responsible for every problem by any means. But maybe if our answer is "Darn QC!" the problem is ours. If we answer the report by "equipment secured" are we really taking care of the problem? The immediate problem is taken care of but what about the underlying cause? Could we be part of the cause? I think so. Maybe our attitude is being reflected back at us in the report.

We can approach it in another way also. We observe a technician handling hazardous materials without using the proper safety equipment and do and say nothing. We, as supervisors, are giving our tacit approval to disregard established safety procedures and tech data. Our people will pick up on it very quickly. It won't be long until all but a few are ignoring the proper procedures. Remember, "if the boss isn't worried, why should I be?" Just like a mirror, our own attitudes and actions are reflected back at us in the attitudes and actions of our people.

I am not saying that all of us, or even most of us, are guilty of the type things mentioned above. However, it only takes one supervisor somewhere in the chain to "drop the ball" and get it rolling the wrong way. Once the fumble has occurred it takes a lot of scrambling by everyone to recover the situation. For that reason it is essential that everyone in a supervisory position understands the importance of his position. The supervisor must accept the importance of the supervisory function and accept the responsibilities that go with the position. The supervisor is the key to a safe operation. The supervisor's attitude, our attitude, will be reflected in the quality of the work performed by the work force.

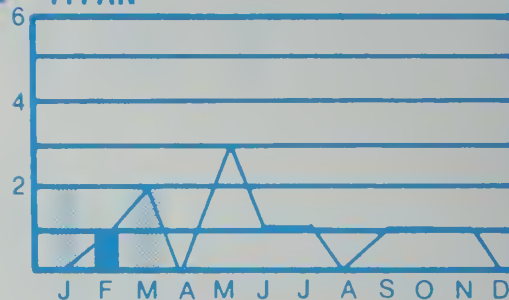
If we treat the "little" things in the proper manner and have the proper attitude our people will pick up on it. It won't be long before the types of discrepancies mentioned earlier begin to disappear. As they disappear our chances for a potentially major mishap are decreased. By honestly evaluating our own attitudes, and performing an "attitude adjustment" where necessary, we treat the cause of the disease. By treating the disease we eliminate the symptoms and avoid unwanted complications. If we show the proper attitude and accept our supervisory responsibilities our people will imitate us. The lowest level of supervision takes its clues from the ones above it. The on-site team chief's attitudes are nothing but a reflection of the ones above. After all, if the boss isn't worried, why should I be?



1981

Space & Missile Mishap Experience

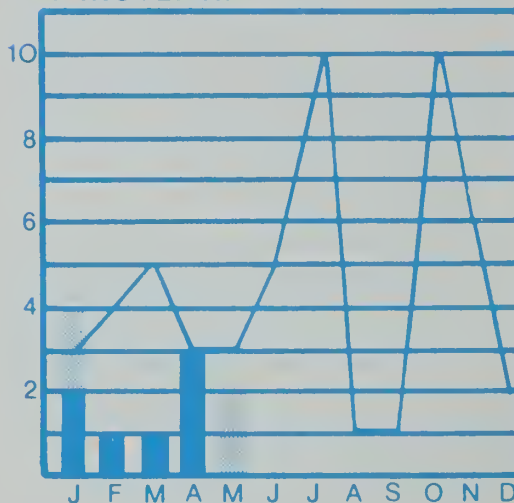
TITAN



AIR LAUNCH MISSILE



MINUTEMAN



PERSONNEL
ERROR

NON PERSONNEL
ERROR

TOTAL MISHAPS
1980



MINUTEMAN CREW

MINUTEMAN Crew R-002, 341st SMW, Malmstrom AFB: MCCC 1Lt Stephen R. Turley and DMCCC 2Lt Jeffrey R. Ash.

PROFESSIONAL PERFORMERS

TITAN CREW

TITAN Crew E-152, 390th SMW, Davis-Monthan AFB: MCCC 1Lt Charles F. Gregory, DMCCC 2Lt Eldon K. Adams, MSAT TSgt Floyd K. Meglii, and MFT AIC Kim L. Scott.



Points to Ponder

WHAT'S BEHIND THE NAME OF AN APPROACH?

Captain James M. Sullivan
and
Captain John C. Conley
1st Combat Evaluation Group
Barksdale Air Force Base, Louisiana

Look at the HI-VOR or VOR/DME2 Rwy 19 Approach at K.I. Sawyer AFB (see Figure 1). Can you identify a problem area?

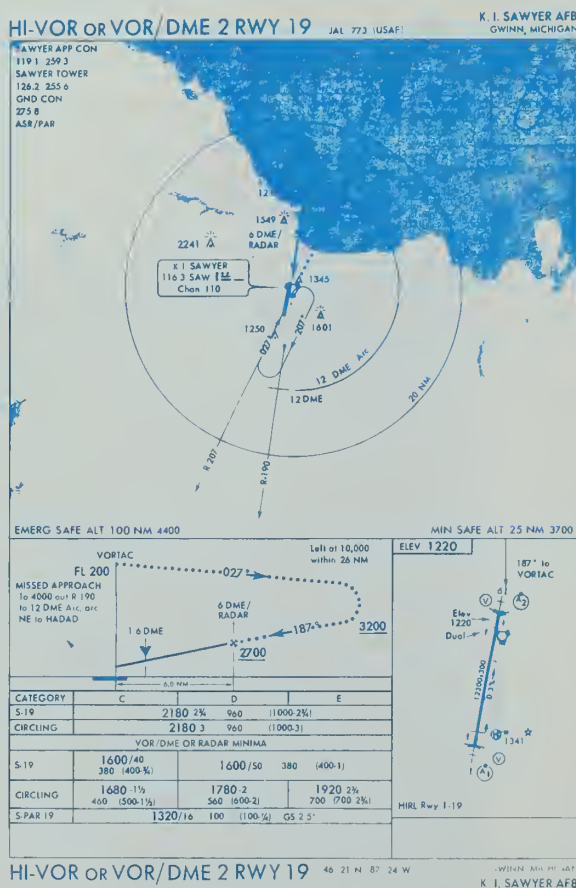


Figure 1

First, let's look at the name of the approach. We see that you can shoot the approach if you have VOR or VOR and DME. We also see that the approach has two sets of minima depending on your equipment. The first minima block is for the VOR only approach and the second minima block for the VOR and DME or VOR and RADAR. The DME and/or RADAR will allow you to identify the Final Approach Fix (FAF) at six miles. The 2700 foot "at or above" altitude restriction applies to the VOR/DME approach and not the VOR only approach.

But what about the missed approach? How can a VOR only equipped aircraft follow the missed approach instruction to 12 DME and HADAD? Since the missed approach instructions are not compatible with the HI-VOR-only approach you must obtain alternate missed approach instructions prior to executing the approach.

Likewise, when using the VOR DME approach with the DME NOTAMed out and RADAR is used to identify the FAF, then again you must obtain alternate missed approach instruction prior to executing the approach.

Other problem areas can be found with the approach, but the point to be made is that "a little serious mission planning can save a costly mistake."

NOTE: For the purpose of defining approach fixes by RADAR, AFM 55-9 (TERPS) specifies which ground radar systems meet the necessary criteria. ASR may be used for any terminal area fix except to identify the middle marker. PAR may be used to form any fix within its coverage. The manual further states that military airborne radar procedures will be developed at a later date. Airborne radar is not yet considered satisfactory for defining approach fixes.

Selected Low Altitude Approaches

Earlier this year the Defense Mapping Agency Aerospace Center released the new five volume set of Selected Low Altitude terminal approach books which reduce the bulk in the cockpit by eliminating approach procedures to airfields where most USAF aircraft cannot land. The new books contain ap-

BIG INSTRUMENT

proach procedures for airfields with runway length of at least 5000 feet and a weight bearing capacity of T60 or greater (except LF/MF NDB and COPTER procedures, unless specifically requested by the Military Departments). Civil procedures are published only if needed and approved by the Military Departments. The new books also contain the Radar Instrument Approach Minimums charts and expanded airfield diagrams for INS and taxi information.

The new book is a very neat package indeed — but a word of *caution*. As when using other terminal procedure books, these new books should be thoroughly reviewed during mission planning. The five volume set does not include every useable approach to the destination airfield, so you should insure that the desired approach for the landing base is in the selected volume. Then, review proper approach categories and changes directed by the Military Aviation Notice (MAN). When using the Radar minima charts, remember that the footnotes cover the RADAR procedures only and that remarks on ILS, VOR, TACAN, and communication data are still in the IFR Supplement. Also, FLIP AP/1 still contains the various special notices and idiosyncrasies of certain bases.

Wind Shear Reports

Pilots have increasingly come to understand wind shear, its effects, and areas where it is most likely to occur. However, some pilots mistakenly assume that once they have met the wind shear enemy and won, their job is completed. Not so! Our responsibility goes further in that we should advise our fellow aviators of the battle we encountered. Other pilots will appreciate knowing the strength of the

enemy forces, their location, disposition, and the strength required by our forces to successfully engage and win. The FLIR Enroute Supplement states that pilots will report wind shear to the controlling agency and, if time permits, relay a report to METRO. The report should include any loss or gain of airspeed and the altitude at which it occurred. If that detail cannot be reported, then report the effect on the aircraft (such as thrust required to overcome the shear). Pilots who hear your warning will appreciate it, since half the battle is knowing what's ahead and being prepared.

Visual Separation

In certain weather conditions and traffic situations, pilots may complete an approach under the see-and-avoid concept using visual separation. Air Traffic Control may use two ways to effect this type of separation. In the first, the tower controller sees the aircraft involved and issues appropriate avoidance instructions. In the second instance, the pilot sees the other aircraft involved and, upon instructions from the controller, provides his own separation. (FAA Handbook 7110.10F)

The Airman's Information Manual (AIM) defines pilot responsibilities in this case. When a pilot accepts instructions to follow another aircraft or provide visual separation, it is an acknowledgement that the pilot will maneuver to remain in-trail or avoid the other aircraft. Further, pilots should notify the controller if they lose sight of the other aircraft or if for some reason they cannot accept responsibility for their own separation. Remember, when maintaining visual separation, the *pilot* accepts responsibility for wake turbulence separation.



CREW OF THE MONTH

Crew E-134, 305th AREFW includes Capt William Murphy, pilot; Capt Clyde Ayer, copilot; Capt Myron Williams, instructor navigator; and Sgt Jerry Williams, boom operator.

Capt Murphy's aircraft was number three in a cell of KC-135's ferrying F-4J's to California. Approximately 950 miles from coast-in, one of the F-4's lost oil pressure and shut down the starboard engine. The single engine F-4 could not maintain altitude or airspeed. Capt Murphy's crew immediately left the cell, cleared the consolidated track system and initiated an emergency descent to FL 150 to accompany the crippled F-4. McClellan Airways was notified of the emergency and a Duckbutt HC-130 was launched to intercept the new cell. Since the single engine F-4J could not maintain airspeed and take on fuel, Capt Murphy tried a toboggan refueling. This was also unsatisfactory because the drogue became extremely unstable. By this time the F-4 was getting low on fuel. Capt Murphy directed the F-4 to the contact position at air refueling airspeed and as he started to take fuel, the tanker crew reduced the airspeed to just under 250 KIAS. Using this technique, the F-4 was able to onload fuel. Three air refuelings were accomplished in this manner. Capt Murphy's crew also conducted a perfect overwater intercept rendezvous with the HC-130 so a rescue aircraft was available if needed. After insuring the safe recovery of the crippled F-4, Capt Murphy's crew continued with their mission. Because of their outstanding airmanship and judgment, Crew E-134 saved a valuable aircraft and its crew.

SAC SAFETY OFFICER

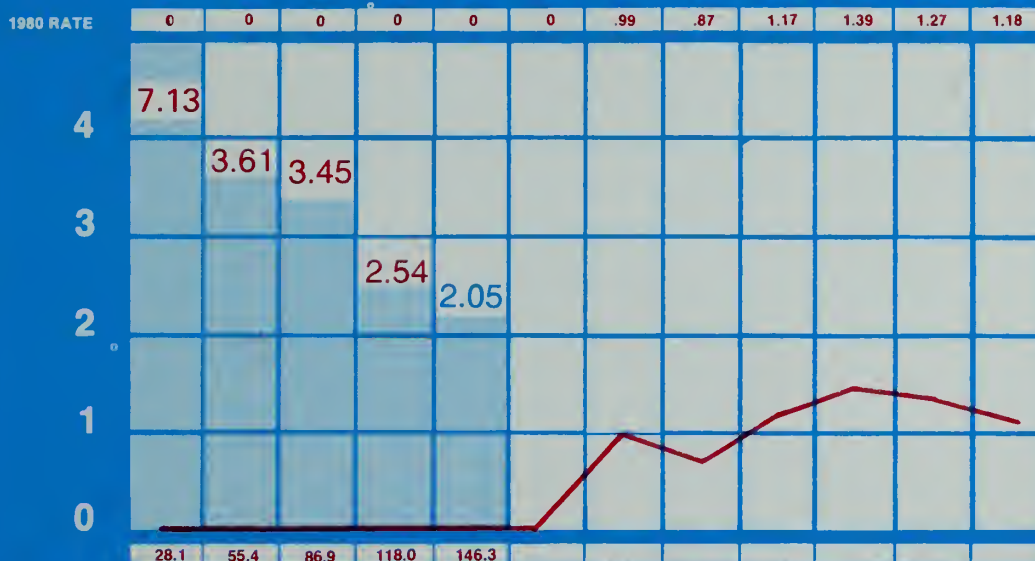
Lt John I. Pargeon is named SAC Safety Officer of the Month for sustained outstanding performance as the unit safety officer of the 741st SMS, Minot AFB. His dedication, enthusiasm and professional approach to both his unit's safety program and that of the base has produced tangible results. In July, 1979, after being assigned to the squadron, Lt Pargeon volunteered to become the squadron's safety representative. As a result of his management skills and individual effort, he changed this program from a satisfactory one to one which sets the standards for other wing organizations to follow. The squadron safety program was rated excellent by the SAC IG during the October 1979 and March 1981 inspections. Upon becoming the squadron safety officer, Lt Pargeon undertook a program to brief individuals on a one-to-one basis on the hazards of various sports activities. The effectiveness of this program is reflected in the lack of disabling injuries incurred by squadron personnel participating in sports. Lt Pargeon is a totally dedicated professional. His achievements are a credit to himself, the squadron and the wing.





1981 Flying Safety Rate

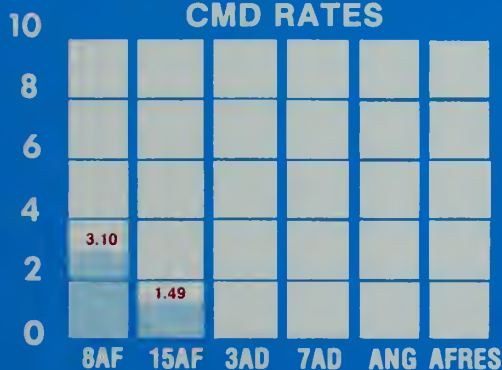
SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



CUMULATIVE FLYING TIME (1,000 HRS)

MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1980	0	0	0	0	0	0	2	0	1	1	0	0
1981	2	0	1	0	0							

1981 SUBORDINATE CMD RATES



LEGEND  = 1980 RATE (SAC)
 = ANG
 = AFRES

MISHAP STATUS

KC-135 A
 FB-111A
 RC-135S

JAN '81
 JAN '81
 MAR '81

UNIVERSITY OF FLORIDA



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1946 — STRATEGIC AIR COMMAND — 1981

FLARE



DAVE WADE